537. In addition to the activities discussed in previous sections of this report, other economic activities may be affected by flycatcher conservation activities. These activities include recreation, fire management, other Federal land management actions, and military activities. Specific Federal lands management actions that have incorporated flycatcher conservation activities in the past have included fire management, exotic plant removal, management plans, restoration projects, pesticide use, and land exchanges.

538. This section describes impacts of flycatcher conservation on these activities and provides information on potential future impacts. For the most part, the impacts to these activities resulting from flycatcher protection efforts include section 7 consultation efforts and related project modifications such as surveying and monitoring. In addition, there have been some impacts related to closures of recreation areas. Impacts to military activities have been primarily related to the administrative efforts of section 7 consultations. This analysis does not attempt to quantify impacts to military readiness that may result from flycatcher conservation activities. Future impacts to military activities may increase slightly due to additional consultations and surveying requirements related to CHD. However, the types of project modifications recommended by the Service are not expected to change.

9.1 Impacts to Recreation Activities

539. A variety of recreational activities occur in the proposed CHD including hiking, camping, picnicking, fishing, hunting, boating, river rafting and off highway vehicle (OHV) use. In some cases, flycatcher conservation activities have resulted in limits on areas available for certain recreational activities. The following section details impacts to recreation activities in the proposed CHD, organized by recovery unit.

9.1.1 Coastal California Recovery Unit

Santa Ana Management Unit

540. Portions of the San Bernardino NF fall within this Management Unit. During the flycatcher breeding season, the forest restricts use on a portion of the Thurman Flats picnic area. There is a flycatcher nesting location adjacent to the Thurman Flats picnic area along Mill Creek. Conservation measures have included fencing and barriers around the nest site

and weekend patrols to guard the nest site, ongoing since 2000 at a cost of approximately $3,000 per year. Discussions with San Bernardino NF indicate that this closure has not affected the amount of recreation use in the area, as the closure includes only a portion of the picnic area.[316]

San Diego Management Unit

541. Portions of the Cleveland NF fall within this Management Unit. There is a flycatcher nesting location adjacent to a picnic area along the San Luis Rey River. However, the forest has not closed off any of the area to accommodate flycatchers. Thus, use of the area has not been affected.[317] The forest has implemented a variety of conservation activities at this picnic area, including:

- Posting additional signs inform the public and to limit activity outside of the developed picnic area;
- Installing animal proof garbage bins to limit predators in the area; and
- Removing some picnic tables closer to the occupied flycatcher areas.

Flycatcher was only one reason for undertaking these measures; in addition, there are issues with Least Bell's vireo, and some of these measures may have been implemented regardless of the flycatcher. The cost of these measures has been minimal.

9.1.2 Basin And Mojave Recovery Unit

Kern Management Unit

542. Lake Isabella, a popular recreation area with more than two million visitors a year, is located in this Management Unit. There has been substantial public concern regarding potential limitations on water levels in the lake that were agreed to as part of a biological opinion resulting from the USACE consultation on Lake Isabella dam operations. In particular, the biological opinion states "[i]f the interim measures or the purchase of 1,100 acres are not completed by March 1, 2000, the USACE will not allow the reservoir to rise above 2,584 feet in elevation (inundate the South Fork Wildlife Area (SWFA)) for the period of March 1 through September 30 each year until the land is purchased or a permanent conservation easement is in place."[318] However, due to recent drought conditions, these limitations have not resulted in changes to water operations because water levels were already below required elevations. Therefore, there have been no past impacts on lake levels from flycatcher conservation activities. In addition, because the purchase of the land is

[316] Personal communication with Steve Loe, San Bernardino NF, August 24, 2004.
[317] Personal communication with Kirsten Winter, Cleveland NF, August 27, 2004.
[318] U.S. Fish and Wildlife Service, Sacramento Office. 2000. Letter from Cay G. Goude, Acting Field Supervisor, Sacramento Fish and Wildlife Office, to Colonel Michael J. Walsh, District Engineer, U.S. Army Corps of Engineers, re: Reinitiation of Formal Consultation on the Army Corps of Engineers Long-term Operation of Isabella Dam and Reservoir, dated June 14, 2000.

nearly completed, the lake level is not expected to be limited for flycatcher conservation in the future.[319]

543. A Decision Memo by the USFS describes the habitat protection measures affecting recreation activity in the SFWA. To date, there have been various impacts on recreational activity at Lake Isabella due to flycatcher conservation activities, including:[320]

- ***Efforts to control watercraft, including a five miles per hour speed limit within 100 feet of riparian areas in the SFWA***. This speed limit is in effect year round; but in practicality, the areas affected are inundated for only five weeks each year. In addition, since the listing of the flycatcher, there was only enough water to inundate this area during the years from 1995 to 1999. From 2000 to 2004, there has not been enough water for the speed restriction to have an impact on recreationists; however, USFS still incurred costs related to maintenance. USFS has spent approximately $97,000 (2004 dollars) to enforce this speed limit in the past. This includes an initial investment to purchase buoys to mark the speed enforcement area, a patrol boat, personal watercrafts and to pay salaries for maintenance and enforcement personnel. Over the next 20 years, enforcement efforts by USFS will total approximately $153,000 (2004 dollars assuming a seven percent discount rate), including annual maintenance and enforcement, as well as future boat replacement. These future costs equate to $7,600 annually.

- ***Prohibition on overnight camping and motorized vehicle travel in the SWFA in order to protect the unique habitat in the area***. This has resulted in loss of some recreation activity, specifically boaters who would launch small boats from a nearby ravine and access the shoreline to camp on an unimproved area along a small stretch of shoreline in Sequoia NF. However, this area had already been closed to camping since 1994 and was not a designated camping area. USFS indicates that the amount of overnight camping that was occurring in that area was very limited because it was such a small area and only accessible by boat; approximately 10 to 15 individuals would camp there on holiday weekends.[321] Boats may still access this area; however, the closure to motorized vehicles restricts where boats can be launched. Thus, small boats that would have used a nearby launch would now have to be launched further away and the return trip to the launch site would be very difficult because of wind conditions on the lake. USFS recreation staff indicated that there are other overnight camping areas in the forest; however, other nearby areas are not as easily accessible by boat or conducive to fishing, so the quality of the experience may be affected. This analysis does not attempt to quantify this loss in quality of the experience, and no regional economic impacts are expected as a result of this overnight camping restriction. Fishing has not been prohibited, and larger boats that can return upwind to launch sites can still be used to access the area.

[319] Meeting with USACE and Kern River Water Master, Lake Isabella, CA on June 29, 2004.
[320] Fax communication from Sue Porter, USFS, September 15, 2004.
[321] Email communication from Sue Porter, USFS, October 1, 2004.

9.1.3 Lower Colorado Recovery Unit

Little Colorado Management Unit

544. Apache-Sitgreaves and Gila NFs both have lands within this Management Unit. To date, recreation activities have not been impacted by flycatcher conservation activities in this area. The Greer Recreation Area in Apache-Sitgreaves NF is a popular recreational fishing location. Because it is a designated recreation area, this area is closed to motorized vehicle use. Fishing and hiking is popular along both the East and West Forks of the Little Colorado River, as well as by boat and along the shoreline of Greer Lakes. The proposed CHD is not expected to affect recreational activity in this area; however, if the forest were to implement any closures to recreational use for the flycatcher, economic impacts would be likely. Apache-Sitgreaves NF staff estimate that approximately 70,000 to 75,000 people use the recreation area annually.[322]

Virgin Management Unit

545. A portion of Lake Mead National Recreation Area falls in this Management Unit. As discussed in the previous section, recreational activity at Lake Mead has not been impacted by flycatcher conservation. In addition, dispersed recreation occurs along the Virgin River in Utah on City of St. George, BLM and private lands. Review of a 1998 biological opinion indicates that "recreation that degrades riparian habitat will be prohibited in riparian areas on Bureau land along the Virgin River."[323] However, discussion with BLM outdoor recreation staff indicates that recreation along the Virgin River has not been affected by flycatcher conservation activities to date. In the future there is some potential for expansion of existing walking trails to be affected by flycatcher conservation. The City of St. George may be developing additional trails.[324] If this development is funded with Federal money, there could be some administrative costs associated with consulting on development of additional trails in the proposed CHD. However, project modifications and associated impacts are not expected.

Middle Colorado Management Unit

546. Grand Canyon National Park (NP) and Lake Mead National Recreation Area both fall within this Management Unit. There have been various closures affecting recreation activity at the Grand Canyon. Past closures, which were implemented at various times between 1993 and 1997, have meant that rafting groups and backcountry campers could not use an overnight camping area at mile 50-51, and had to continue approximately two to three miles further downstream to an alternative campsite. However, with available substitutes

[322] Personal communication with Barbara Romero, Recreation Specialist, Apache-Sitgreaves NF, September 9, 2004.
[323] U.S. Fish and Wildlife Service, Phoenix Office. Formal Consultation #2-21-96-F-132. Programmatic Biological Opinion for Proposed Amendment to the Arizona Strip Resource Management Plan. January 28, 1998.
[324] Personal communication with R.J. Hughes, Outdoor Recreation Planner, BLM St. George, Utah office, September 30, 2004.

nearby, these closures have not affected the number of visitors to the NP.[325] The Grand Canyon is an extremely popular rafting destination; people wait for years to receive a permit for a private rafting trip. Approximately 22,500 recreational users participating in private rafting trips and commercially guided trips in 2003; approximately 80 percent of this occurred between May and September.[326] While the beach closures for the flycatcher may have caused some inconvenience for guides who were accustomed to stopping in that area; economic impacts related to this inconvenience has been minimal.

547. In a programmatic biological opinion done for recreational activities in Lake Mead NRA, conservation measures for the flycatcher included additional surveys of potential flycatcher habitats and closures to restrict land and lake access by recreationists to any sites where breeding pairs of flycatchers are found.[327] However, discussions with Lake Mead NRA indicate that to date, recreation at Lake Mead has not been affected by flycatcher conservation activities. While access to Lake Mead has been limited by low water levels forcing closure of ramps near flycatcher habitat (e.g., Pearce Ferry), these closures have not been related to flycatcher conservation.[328]

Pahranagat Management Unit

548. This Management Unit contains several State-run Wildlife Management Areas, as well as a portion of Lake Mead NRA. Discussions with the Nevada Department of Wildlife indicate that there have not been any flycatcher-related impacts to recreational activities at Overton and Key Pittman Wildlife Management Areas. As discussed previously, recreational activity at Lake Mead has not been impacted by flycatcher conservation.

Bill Williams Management Unit

549. This Management Unit contains Alamo Lake, a popular recreation area and the Bill Williams National Wildlife Refuge (NWR). To date, flycatcher conservation has not impacted recreation activities in this area. The Bill Williams NWR is managed for recreation and wildlife conservation purposes. No specific measures have been necessary to protect the flycatcher. Hunting and off-highway vehicle activities on the Bill Williams NWR do not overlap with the proposed CHD. Ninety percent of the visitation to the Bill Williams NWR is by boat, and the refuge is a no wake zone. Flycatcher surveys in the area are performed by the Arizona Game and Fish Department (costs of these efforts are included in Section 4).

[325] Personal communication with Elaine Leslie, Biologist, Grand Canyon NP, August 30, 2004.
[326] Personal communication with Linda Jalbert, Outdoor Recreation Planner, Grand Canyon NP, September 28, 2004.
[327] U.S. Fish and Wildlife Service, Phoenix Office. Formal Consultation #02-21-01-F-0263. Memorandum re: Lake Mead National Recreation Area Lake Management Plan, dated October 7, 2002.
[328] Personal communication with Ross Haley, Wildlife Biologist, Lake Mead National Recreation Area, July 15, 2004.

Parker to Southerly International Border Management Unit

550. This Management Unit contains portions of Cibola and Imperial National Wildlife Refuges. No impacts to recreation activities are expected at either of these refuges. Discussion with Imperial NWR indicates that flycatcher habitat contains very dense vegetation that is not conducive to recreational use.[329]

9.1.4 Gila Recovery Unit

Verde Management Unit

551. This unit includes portions of the Tonto NF, Coconino NF and Prescott NF. There is only limited recreational activity in these forests along the Verde River, none of which is expected to be affected by flycatcher conservation activities. In particular, in the Tonto NF there have not been any restrictions on recreation in this Management Unit related to flycatchers.[330]

Roosevelt Management Unit

552. The Roosevelt Management Unit is the area with the largest impacts on recreation related to flycatcher conservation. Within the proposed CHD, the Tonto has had closures in place since 1998 on both the Salt River and in Lake Roosevelt on the Tonto Creek end.[331] The closures limit vehicle use and fires; fishing and hunting are not prohibited in these areas. However, because of the nature of the catfishing and hunting activities that have historically occurred in these areas, these closures have likely affected the level of recreational use on the Tonto NF. Catfishermen and dove and quail hunters may prefer to be able to drive in to a site, rather than haul coolers and equipment down to the river. Thus, a number of these fishermen and hunters have likely chosen to go elsewhere, outside of the local area, to participate in these activities. As Roosevelt Lake is not a destination for out-of state tourists, the fishermen and hunters most likely affected by these closures are Arizona residents who will continue to fish or hunt at substitute recreational sites available within the state.

553. USFS estimates that the Tonto NF gets approximately 6.2 million visitors per year.[332] While visitor use at dispersed recreation sites on Roosevelt Lake area is not available, the EIS for the HCP at Roosevelt Lake estimates that in 2001 there were approximately 600,000 visitor days in 2001.[333] A study funded by Arizona Game and Fish Department provides 2001 data on the economic impacts of hunting and fishing in Arizona at the county level. This study indicates a total of 413,374 angler days and 75,510 hunter days in 2001 in Gila

[329] Personal communication with Sky Wagner, Biologist, Imperial National Wildlife Refuge, September 28, 2004.
[330] Personal communication with Todd Willard, Cave Creek Ranger District, Tonto NF, August 27, 2004.
[331] It is worth noting that Tonto NF is developing a bald eagle closure unrelated to flycatcher along the Tonto Creek arm of Roosevelt Lake that surrounds much of the flycatcher habitat. Comments of Regional Director, Service, Region 2, January 5, 2005.
[332] USFS 2003. Biological Opinion on the Draft Biological Assessment of 11 Land & Resource Management Plans, USDA Forest Service Southwestern Region. Submitted to the U.S. Fish and Wildlife Service in November 2003. p. 228.
[333] Final Environmental Impact Statement for the Roosevelt Habitat Conservation Plan.

County, Arizona (where Roosevelt Lake is located). As presented in Exhibit 9-1, displaced recreation due to closures for flycatcher are estimated to 4,050 fishing and hunting days, which equates to less than one percent of this activity in Gila County in 2001.[334]

554. While the Tonto NF does not track usage of the undeveloped areas that were included in the two 1998 closures, recreation staff at the Tonto Basin Ranger District provided estimates of the number of recreationists affected annually on average. The flycatcher related closure on the Salt River arm may have displaced up to 3,000 catfishermen annually. Of these, approximately 75 percent continue to fish at alternative sites in the Roosevelt Lake area, while 25 percent or 750 fishermen likely go elsewhere in Arizona. Similarly, the flycatcher related closure on the Tonto Creek arm may have displaced up to 3,000 fishermen and 2,000 hunters. Of these fishermen, approximately 50 percent continue to fish at alternative sites in the Roosevelt Lake area, while the other half or 1,500 fishermen likely go elsewhere in Arizona. Of these hunters, approximately 10 percent continue to hunt at alternative sites in the Roosevelt Lake area, while 90 percent or 1,800 hunters likely go elsewhere in Arizona. Thus, in total, 2,250 angler days and 1,800 hunting days are lost to the region (Exhibit 9-1). These lost visitor days result in two types of economic impacts: efficiency effects resulting from the loss of use of the area, and distributional impacts related to loss of local spending by fishermen and hunters in the Roosevelt Lake region.

Exhibit 9-1

NUMBER OF RECREATION DAYS LOST DUE TO FLYCATCHER CLOSURES AT TONTO NF (ANNUAL SINCE 1998)

	Angler Days	Hunting Days	Total Days
Salt River arm	750	--	750
Tonto Creek arm	1,500	1,800	3,300
Total Lost Trips	**2,250**	**1,800**	**4,050**

555. This analysis does not attempt to value the impacts related to displaced fishermen and hunters who continue to participate in fishing or hunting within Tonto NF. While there may be some loss of consumer surplus associated with the inconvenience of having to use a different location, especially if this area is already congested, data on the value associated with lower trip quality are not available. For example, the loss would depend on a variety of factors including the distance to an alternative site (which could be closer depending on the point of embarkation) and the amount of congestion at the alternative site. Rather, this analysis focuses on valuing impacts related to the trips that will no longer occur in the Roosevelt Lake area.

[334] Arizona Game and Fish Department. 2001 Estimated Angler Use Days extrapolated from license sales.

Defining Consumer Surplus and Welfare Effects. Welfare economics is based upon the idea that social welfare can be maximized by using resources in ways that yield the greatest benefits to society. Economists generally rely on consumer surplus as a measure of net social welfare. Consumer surplus is based on the principle that some consumers benefit because they are able to purchase goods or services at a price that is less than their total willingness to pay (i.e., the maximum amount they would pay for the good). In the context of this analysis, consumer surplus is realized by fishermen and hunters when the value of their fishing or hunting experience exceeds the "price" they pay for the experience in terms of travel costs, equipment costs, and other fees.

Efficiency Effects

556. This section estimates the consumer surplus, or welfare, impacts associated with lost fishing and hunting opportunities in Tonto NF (see Text Box). Because areas along the Salt River and Tonto Creek are closed to motorized vehicle use, some fisherman and hunters choose to go elsewhere to participate in this activity. For the purposes of this analysis, for fishing and hunting trips no longer taken in the Roosevelt Lake area, the total welfare value of these trips is estimated to represent the efficiency loss. This may overstate impacts if the fisherman or hunter continues to fish in another location; however, as alternatives are not likely to provide a similar quality of experience, this high-end estimate was considered reasonable for this analysis.

557. Estimates of the consumer surplus generated by fishing and hunting in Tonto NF requires information on the number of trips lost to this area and the value of each trip. The number of lost trips has been estimated by Tonto NF recreation staff and is presented above in Exhibit 9-1. The welfare value of fishing and hunting trips is based on relevant studies from the economic valuation literature, illustrated in Exhibits 9-2 and 9-3, respectively. Based on these studies, the analysis utilizes a value of $26 per day for fishing, and $41 per day for hunting (2004 dollars).

Exhibit 9-2

SUMMARY OF FISHING WELFARE VALUES

Author (date)	Study Location	Species Valued	Value (2004$)*
Roach (1996)	California	Catfish, Black Bass	$25.29 per trip
Hay (1988)	Arizona	Bass	$26.10 per day
Vaughan and Russell (1982)	National	Catfish	$26.96 per day
* Welfare values are adjusted to current dollars using the GDP Deflator, Budget of the United States Government, Fiscal Year 2005, Historical Tables			

Exhibit 9-3 SUMMARY OF WATERFOWL HUNTING WELFARE VALUES		
Author (date)	**Study Location**	**Value (2004$)***
Cooper and Loomis (1993)	California	$34.37 per trip
Hay (1988)	Pacific Flyway (South, includes AZ, CA, NV, UT)	$47.60 per trip
* Welfare values are adjusted to current dollars using the GDP Deflator, Budget of the United States Government, Fiscal Year 2005, Historical Tables.		

558. Based on the welfare values and the number of days of fishing and hunting lost due to the closures for the flycatcher, welfare losses are estimated to total $132,300 (2004 dollars) annually since 1998 as shown in Exhibit 9-4. This equates to a total past economic efficiency effect of $793,800 since 1998 and a potential future impact of $1.4 million (2004 assuming a seven percent discount rate over 20 years).

Exhibit 9-4 ECONOMIC EFFICIENCY LOST DUE TO FLYCATCHER CLOSURES AT TONTO NF			
	Total Lost Days	**Value per Day (Nominal)**	**Annual Welfare Loss (Nominal)**
Fishing	2,250	$26	$58,500
Hunting	1,800	$41	$73,800
Annual Welfare Loss			**$132,300**
Total Welfare Loss over 20 Years @ 7% (2004$)			**$1,500,000**
Total Welfare Loss over 20 Years @3% (2004$)			**$1,895,000**

Distributional Effects

559. Distributional effects, also referred to as regional economic impacts, may result from the loss of fishing and hunting at Roosevelt Lake associated with the closure of two areas to motorized vehicle use.[335] These regional economic impacts are expressed in terms of changes in revenues, local employment, and tax receipts. Direct impacts are felt primarily in the tourism-related sectors of the local economy, while secondary impacts, resulting from the loss of circulation of spending through the local economy, is felt in a broader range of sectors.

560. A study funded by Arizona Game and Fish Department provides 2001 data on the economic impacts of hunting and fishing in Arizona at the county level. This study indicates that there are 488,884 angler and hunter days in Gila County in 2001. For Gila County, average expenditures (adjusted to 2004 dollars) for an angler day are approximately $87, while average expenditures for a hunting day are $72. Given the estimate of 2,250 angler days and 1,800 hunting days lost to the region, this results in a direct economic loss to the area of approximately $325,000 (2004 dollars). This loss in direct spending flowing through

[335] It is important to note that distributional effects are fundamentally different measures of economic impact than efficiency effects, and thus cannot be added to or compared with estimates of changes in economic efficiency.

the economy results in total impacts of approximately $386,000 in lost sales, six jobs, $62,000 in salaries and wages, and $15,000 in state taxes (Exhibit 9-5).[336]

Exhibit 9-5

SUMMARY OF REGIONAL ECONOMIC IMPACTS DUE TO FLYCATCHER CLOSURES AT TONTO NF (2004$)

Total Sales	Jobs	Salaries & Wages	State Tax Revenues
$386,270	6.3	$61,902	$14,857

Source: IEc analysis and Silberman, J. The Economic Importance of Fishing and Hunting, Economic data on fishing and hunting for the State of Arizona and for each Arizona County, accessed at http://www.gf.state.az.us/w_c/survey_results.shtml.

9.2 Fire Management

561. Various agencies and private parties may conduct fire management activities within the proposed CHD. This section is divided into two parts. First, a background discussion on the potential for flycatcher conservation activities to result in a decrease in the effectiveness of actions taken to reduce the risk of catastrophic fire to surrounding communities is presented. Second, Wildland-Urban Interface (WUI) data are utilized to identify areas within the proposed CHD where fire management activities are most likely to occur.

9.2.1 Flycatcher Conservation Activities and Fire Management

562. The Recovery Plan discusses that historically, fire was probably uncommon in flycatcher habitat. However, fire in some riparian zones (primarily low and mid-elevation areas) has increased as a result of flood suppression, dewatering of rivers, and other manmade effects. These changes to the environment have led to the proliferation of more flammable exotic vegetation such as tamarisk, giant reed, and red brome. Ignition sources have also increased due to greater use of riparian areas from recreation and urbanization.

563. The Recovery Plan includes suggested actions for reducing and eliminating the risk and impacts of fire in flycatcher potential breeding habitat. The Plan recommends developing fire risk and management plans and suppression of fires if they occur. It also recommends pro-active management to limit the occurrence and/or extent of fires by developing dry and wet fire breaks, limiting ignition sources, increasing education or fire hazards, and improving riparian habitat conditions (moisture, water flow, habitat restoration, etc.). However, due to the highly flammable nature of tamarisk, controlled burns in this habitat are not recommended, though further research was requested.

564. In the proposed CHD, past impacts on fire management activities due to flycatcher conservation efforts have been limited. The only past consultations related to fire management activities were related to emergency suppression efforts on Federal lands

[336] Silberman, J. The Economic Importance of Fishing and Hunting, Economic data on fishing and hunting for the State of Arizona and for each Arizona County, accessed at http://www.gf.state.az.us/w_c/survey_results.shtml.

managed by BLM. As emergency consultations are conducted after the fact, no project modifications were associated with these past consultations. A review of programmatic biological opinions addressing USFS forest management, and discussions with various agencies indicates that flycatcher conservation activities required for fire management activities, include:

- Timing restrictions to avoid doing fuel treatments (i.e., prescribed burns, fuel breaks) during the flycatcher breeding season.

- Avoidance of occupied habitat as dip spot for fire suppression activities unless risk to life or property exists.[337]

- Avoidance of activities within a certain buffer zone (1/4 mile, ½ mile or more if needed to protect nesting birds from disturbance) around known nest sites or unsurveyed suitable habitat.

- Restricting treatment of riparian areas with potential or suitable flycatcher habitat.

565. Fire management activities are generally limited within the proposed CHD on USFS and NP lands, due to the location of flycatcher habitat within the riparian zone. This is further illustrated in several documents used by Action agencies in managing Federal lands:

- The Grand Canyon NP Fire Management Plan indicates that no wildland fire use activities are planned in or near flycatcher habitat.[338]

- The Draft Biological Assessment of the USFS Region 3 Resource Management Plans indicates that "Prescribed fires in the Region average vary [sic] from NF to NF (Table 7); it is not known how many of these, if any are conducted in riparian areas but most, if not all, are probably in upland areas….Direct reduction of fuel loads in wild land-urban interface areas have occurred (Figure 8) but treatments in riparian areas are limited."[339]

- The USFS Region 3 WUI Biological Assessment states that, for USFS lands, "treatments are unlikely to occur in flycatcher habitat, as these areas area generally fairly wet and are not considered a fire risk."[340]

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[337] Personal communication with Deanna Williams, Carson NF, August 24, 2004.

[338] U.S. Fish and Wildlife Service, Phoenix Office. Formal Consultation #02-21-01-F-0118. Memorandum re: Biological Opinion for the Grand Canyon National Park Fire Use Program, dated June 11, 2003.

[339] USFS 2003. Biological Opinion on the Draft Biological Assessment of 11 Land & Resource Management Plans, USDA Forest Service Southwestern Region. Submitted to the U.S. Fish and Wildlife Service in November 2003.

[340] USFS 2001. Biological Opinion on the USFS Proposed Wildland/Urban Interface (WUI) Fuel treatments in New Mexico and Arizona and their effects on listed and proposed species in accordance with section 7 of the Endangered Species Act, Service, April 2001.

566. For Southern California NFs (including San Bernardino and Cleveland NFs), USFS Region 5 indicates that USFS has proposed "to not conduct prescribed burns within a ¼ mile of listed riparian bird nests sites, when occupied."[341] In Albuquerque, several informal consultations have occurred with USACE regarding fuel treatments, and the Service has conducted several technical assistance efforts with the City of Albuquerque regarding fuel treatments. In most cases, the Service has determined that activities would not affect flycatcher habitat. In one case, the USACE delayed implementation of the project until the end of the nesting season.[342]

9.2.2 Wildlife-Urban-Interface Areas within Proposed CHD

567. In flycatcher habitat areas, and in many areas across the U.S., the Department of Agriculture and the Department of the Interior are jointly implementing what is known as the "National Fire Plan," which grew out of a report to the President called *Managing the Impacts of Wildfire on Communities and the Environment: A report to the President in Response to the Wildfires of 2000.* The National Fire Plan calls for a substantial increase in the number of forested acres treated annually to reduce hazardous fuels. Under the plan, Wildland-Urban Interface (WUI) areas are defined by each agency "where human life, property, and natural resources are in imminent danger from catastrophic wildfire."[343] WUI are areas where houses meet or intermingle with undeveloped wildland vegetation. This makes the WUI a focal area for human-environment conflicts such as wildland fires.[344]

568. This analysis relies on data developed by the University of Wisconsin that integrates U.S. Census and USGS National Land Cover Data to map WUI areas according to the Federal Register definition of WUI (Federal Register 66:751, 2001).[345] WUI areas are composed of both "interface" and "intermix" communities. In both communities, housing must meet or exceed a minimum density of one structure per 40 acres. Intermix communities are places where housing and vegetation intermingle. Intermix areas are characterized by continuous wildland vegetation and more than 50 percent vegetation. Interface communities are areas with housing in the "vicinity" of contiguous vegetation, that is, areas with less than 50 percent vegetation but within 1.5 miles of an area over 1,325 acres (500 ha) that is more than 75 percent vegetated. The California Fire Alliance defines "vicinity" as all areas within 1.5 miles of wildland vegetation, roughly the distance that firebrands can be carried from a wildland fire to the roof of a house. Including interface

[341] USFWS 2001. Biological and Conference Opinions on the Continued Implementation of Land and Resource Management Plans for the Four Southern California National Forests, as Modified by New Interim Management Direction and Conservation Measures (1-6-00-F-773.2). February 27, 2001.
[342] Personal communication, Service, Albuquerque Ecological Services Office, February 14, 2005.
[343] USFS 2001. Biological Opinion on the AUSFS Proposed Wildland/Urban Interface (WUI) Fuel treatments in New Mexico and Arizona and their effects on listed and proposed species in accordance with section 7 of the Endangered Species Act, Service, April 2001.
[344] "The Wildland-Urban Interface," University of Wisconsin, Department of Forest Ecology & Management, Spatial analysis for conservation and sustainability (SILVIS) Lab, Online at: http://silvis.forest.wisc.edu/projects/WUI_Main.asp, Accessed on: November 30, 2004.
[345] "The Wildland-Urban Interface," University of Wisconsin, Department of Forest Ecology & Management, Spatial analysis for conservation and sustainability (SILVIS) Lab, Online at: http://silvis.forest.wisc.edu/projects/WUI_Main.asp, Accessed on: November 30, 2004.

communities captures the those homes that are at risk of being burned in a wildland fire, regardless of whether or not the homes sit within the forest area.

569. Based on an analysis of the WUI data, overlap of the proposed CHD with WUI areas is limited. Approximately 26,000 acres of WUI areas fall within the proposed CHD across 36 counties. Of this, seven counties account for the majority, 74 percent, of the total acres. As shown in Exhibit 9-6, approximately 107,000 acres have been proposed as flycatcher CHD in those seven counties. In total, seven percent of the total number of proposed CHD acres overlaps with WUI areas. The number of acres that overlap WUI areas is presented by Management Unit in Exhibit 9-7.

Exhibit 9-6

WILDLAND URBAN INTERFACE AREAS IN PROPOSED CHD (HIGHLIGHTING COUNTIES WITH LARGEST WUI OVERLAP)

State	County	CHD (Acres)	Overlap with WUI (Acres)	Overlap as a Percent Of CHD Acres In County
CA	San Diego	14,631	3,731	25%
AZ	Pinal	20,206	3,385	17%
AZ	Yavapai	7,317	3,256	44%
AZ	Gila	32,169	2,964	9%
NM	Rio Arriba	4,383	2,179	50%
UT	Washington	2,977	1,995	67%
CA	San Bernardino	25,012	1,827	7%
Various	Various	269,308	6,664	2%
	TOTAL:	**376,000**	**26,000**	**7%**

Note: Counties not included in this table contain 6,792 acres of WUI area that overlaps with proposed CHD.
Source: University of Wisconsin, Department of Forest Ecology & Management, Spatial analysis for conservation and sustainability (SILVIS) Lab, Online at: http://silvis.forest.wisc.edu/projects/WUI_Main.asp

570. As part of the National Fire Plan effort, Action Agencies published new regulations for implementing section 7 consultation requirements in December 2003. These regulations provide an alternative process that "eliminates the need to conduct informal consultation and eliminates the need to provide written concurrence from the Service for those National Fire Plan actions that the Action Agency determines are "not likely to adversely affect (NLAA) any listed species or its designated critical habitat." Thus, future informal consultation efforts on fire management activities are expected to be streamlined.[346]

571. In addition, given the limited amount of fire management activity occurring in the proposed CHD, impacts to fire management activities are expected to be minimal. Expected impacts include administrative costs related to consultation on fire management plans,

[346] "Joint Counterpart Endangered Species Act Section 7 Consultation Regulations," 68 FR No 235, p. 68254, December 8, 2003.

suppression activities and any future treatment activity, and some future surveying and monitoring efforts. Costs related to these impacts are estimated in other sections.

9.3 Exotic Species Management and Removal

572. The Recovery Plan for the flycatcher identifies three plant groups that may negatively affect the habitat for flycatcher: tamarisk/saltcedar (*Tamarix ramosissima* and closely related species), Russian olive (*Elaeagnus angustifolia*), and giant reed (*Arundo donax*). One complexity is that flycatchers sometimes nest in invasive tree species. For example, the Recovery Plan notes that "Southwestern willow flycatcher have been reported to nest in tamarisk at sites along the Colorado, Verde, Gila, San Pedro, Salt, Santa Maria, and Big Sandy Rivers in Arizona, Tonto Creek in Arizona, the Rio Grande in New Mexico, and the San Dieguito River in California. Along the Lower Colorado River and immediate tributaries, about 40% of the flycatcher nests were in tamarisk in 1998. In Arizona in 1998, three-quarters (194 of 250) of the flycatcher nests were in tamarisk" (citations omitted).[347]

573. Numerous salt cedar removal projects have been undertaken in the proposed CHD by Tribes and Action agencies, including the Service, BLM, BIA, USBR, and USACE. In practice, impacts on exotic/invasive species removal projects due to flycatcher conservation have included both administrative costs related to consulting or otherwise meeting with the Service about a planned activity, in addition to project modifications that result. The Recovery Plan recommends "… clear small parcels of habitat. Do not attempt to clear large areas at a time. We propose a guideline of clearing/restoring no more than 5% of the exotic-dominated area per year, followed by a waiting period of 5 years to determine the success of the restoration project….If the site is occupied, make sure that the areas targeted for clearing do not have any endangered species nest sites, and are at least 100 m away from the closest nest site. Clearing and earthmoving should be timed to avoid the breeding season of the flycatcher and other sensitive species (e.g., late March-September)."[348]

574. In the past, agencies undertaking vegetation removal efforts have been able to identify alternative areas to clear where flycatchers are not an issue; thus, the net impact has been limited to surveying costs and delays as alternative sites were identified and planning efforts completed. Costs related to additional surveying efforts have been included in estimates presented in Section 9.4.1. Impacts on these types of projects generally involve minimal costs associated with planning efforts to reschedule the activity. In particular:

- Section 4 describes the ongoing cooperative effort in the Middle Rio Grande known as the Middle Rio Grande Endangered Species Act Collaborative Program. In addition to this effort, the Middle Rio Grande Bosque Initiative is an ongoing, congressionally supported effort related to the restoration and management of the Middle Rio Grande. In addition, the USACE has an ongoing revitalization project that will create a 20-mile park along the Middle Rio

[347] Recovery Plan, Service, 2002. Appendix H.
[348] *Ibid.*

Grande. There has been some concern that critical habitat designation for the flycatcher may hinder the efforts of these programs.[349] Effects to actions planned by these programs to date has been similar to those experienced by other saltcedar removal and vegetation management projects, primarily including avoiding removal of vegetation during flycatcher breeding season.[350]

- At Imperial NWR, minimal administrative costs of consulting for fire management projects have been incurred, such as the burning of salt cedar habitat.[351]

- Delays in efforts to remove salt cedar and Russian olive at Pahranagat NWR because of the need to conduct flycatcher surveys have occurred.[352]

- Wetland enhancement projects have avoided occupied flycatcher areas in Overton Wildlife Management Area, which is run by the Nevada Department of Wildlife (NDOW). NDOW states that this has only a minor impact to their management actions, as they just choose an alternative location.[353]

9.4 Impacts to Other Federal Land Management Activities

9.4.1 Surveying and Monitoring

575. Various agencies conduct flycatcher surveying and monitoring. Surveying and monitoring may be conducted under existing biological opinions or as part of ongoing conservation activities by an agency. Surveying efforts funded by USBR under its various biological opinions are included in Section 4. Likewise, costs incurred by Tribes related to surveying efforts are included in Section 7. This section summarizes the remaining costs of surveying and monitoring by Recovery Unit.

[349] "Domenici: Delay protection of bird: He says habitat drains bosque." Albuquerque Tribune, March 2, 2005. Accessed at http://www.abqtrib.com/albq/news/article/0,2564,ALBQ_19855_3588411,00.html on March 3, 2005.
[350] Personal communication with Service, Middle Rio Grande Bosque Initiative, Albuquerque Ecological Services Office, on April 1, 2005.
[351] Personal communication with Sky Wagner, Biologist, Imperial National Wildlife Refuge, September 28, 2004.
[352] Personal communication with Jim Doctor, Pahranagat National Wildlife Refuge, September 14, 2004.
[353] Personal communication with Chris Tomlinson, Nevada State Department of Wildlife, September 14, 2004.

Exhibit 9-7

FUTURE COSTS OF FLYCATCHER SURVEYING AND MONITORING EFFORTS (EXCLUDING WATER MGT AND TRIBES), 2004-2023[1]

Recovery Unit	Management Unit	Funding Agency/Organization	Total Past Costs (2004$)	Total Future Costs (2004$, 7% discount rate)
Coastal California	Santa Ana	San Bernadino NF	$8,000	$23,000
	San Diego	Cleveland NF	$145,000	$227,000
Lower Colorado	Little Colorado	USFS, Rocky Mountain Research Station, Phelps Dodge, Air Force	$507,000	$680,000
	Virgin	BLM Utah	$16,000	$228,000
	Middle Colorado	Grand Canyon NP	Minimal	Minimal
	Pahranagat	FWS (Conducted by NV Department of Wildlife)	$62,000	$227,000
	Bill Williams	AZGFD	$49,000	Funding unknown
Gila	Verde	Coconino NF	$22,000	$23,000
Rio Grande	Upper Rio Grande	Carson NF	$4,000	$8,000
Multiple Units		AZGFD	$71,000	$82,000
Total Costs[2]			**$883,000**	**$1,496,000**
Total Future Costs discounted at 3%				**$1,954,000**

Notes:
[1] This does not represent a complete account of all costs related to surveying and monitoring. A large portion of surveying efforts are funded by USBR or USACE under various biological opinions and these costs are included in Section 4. Likewise, costs incurred by Tribes related to surveying efforts are included in Section 7.
[2] Totals may not sum due to rounding.

9.4.2 Resource Management Plans and Other Federal Lands Management Activities

576. Thirteen formal section 7 consultations by the USFS and BLM have been related to land use and resource management plans. Each of these consultations has considered impacts to the flycatcher. Various agencies have also consulted individually for the flycatcher on various Federal land management activities, including: exotic species management, habitat restoration, pesticide use, road repairs, mining and land exchange activities. There have been less than ten formal consultations related to these activities in the past. Conservation recommendations for the flycatcher have included a variety of measures.

- Avoid land-altering projects during the flycatcher breeding season;
- Preparation of flycatcher management plan until Recovery Plan is published;
- Mapping, surveying and monitoring flycatcher habitat;
- Grazing restrictions and cowbird control efforts;
- Create Fire management plan (AZ Strip);
- Monitoring grazing impacts on habitat;
- Salt cedar removal, replanting willow and cottonwood habitat; and
- Recreation limits in occupied territory

577. Project modifications have primarily been related to timing restrictions to avoid flycatcher breeding season. Timing restrictions can be related to the time required to carry out surveys, or to requirements to avoid activities during flycatcher migration and nesting season (April through September). As an example, when surveys identify nesting birds, vegetation removal or pesticide application may be prohibited in that area during the flycatcher breeding season. The costs associated with project modifications included as reasonable and prudent measures in the Resource Management Plan biological opinions have all been addressed in other sections of this report. For example, surveying costs are included in Section 9.4.1, impacts to recreation are discussed in Section 9.1, and grazing impacts are detailed in Section 5.

9.5 Impacts to Military Activities

578. Two military installations in California fall within the proposed CHD: both are located on Camp Pendleton in the San Diego Management Unit. Impacts to past activities occurring on these military lands resulting from flycatcher conservation activities are discussed below. *Note that this analysis does not attempt to quantify the impact to military readiness that may result from flycatcher conservation activities.* Information regarding potential impacts to future military activities resulting from flycatcher conservation was not available for inclusion in this draft economic analysis; it is anticipated that the final economic analysis will incorporate comments and additional information regarding impacts on affected military installations, as available.

9.5.1 Coastal California Recovery Unit

San Diego Management Unit

579. Camp Pendleton falls within this Management Unit and includes a Marine Corps Base and the Fallbrook Naval Weapons Station.

Marine Corps Base at Camp Pendleton

580. In 1995, the Service completed a biological opinion on Programmatic Activities and Conservation Plans in Riparian and Estuarine/Beach Ecosystems on Marine Corps Base, Camp Pendleton (MCBCP). This biological opinion requires additional consultation for any project that may affect the flycatcher. Since 1995 an additional 13 Biological Opinions have been completed as amendments to the 1995 biological opinion addressing a variety of activities; however, none of these 13 opinions have addressed the flycatcher. In addition, MCBCP has developed an Integrated Natural Resource Management Plan (INRMP). The Service determined that activities covered in the INRMP did not require additional consultation because of the 1995 biological opinion, which covers all activities likely to adversely affect the flycatcher.[354]

[354] Personal communication with Service personnel, Carlsbad Field Office, September 14, 2004.

581. MSBCP has undertaken surveying and monitoring for the flycatcher since the late 1990s. For activities occurring in flycatcher habitat, MSBCP attempts to conduct projects outside of flycatcher breeding season in order to avoid impacting the flycatcher. In addition, MSBCP has undertaken habitat restoration projects for benefit of all riparian species.[355]

Fallbrook Naval Weapons Station

582. Fallbrook NWS is working cooperatively with the Service to develop an INRMP that will address conservation needs for the flycatcher. Fallbrook NWS does not currently have any breeding flycatcher on its lands. Currently, Fallbrook does not conduct specific surveys for the flycatcher; however, surveys conducted by MSBCP cover the Santa Margarita River that borders both MSBCP and Fallbrook.[356]

583. Fallbrook recently underwent consultation for its fire management plan. This included informal consultation for the flycatcher, which the Service agreed was not likely to adversely affect. The Service believes measures to offset, avoid or minimize affects to the Least Bell's vireo, as described in the Service's Biological Opinion on the Fallbrook Fire Management Plan, are also adequate to avoid effects on transient flycatchers. If the proposed CHD were in place, this Fallbrook would likely need to reinitiate this consultation.

9.6 Summary of Impacts to Other Activities

584. This section is divided into three parts and provides a summary of all activities addressed in this chapter. The first two parts provide a summary of the past and future monetized impacts to recreation activities (Section 9.1) and the costs of survey and monitoring (Section 9.3.1), discussed in previous sections. The final part provides a summary of impacts on activities that could not be monetized, including fire management activities and military activities.

9.6.1 Past Impacts

585. Past efficiency impacts related to other activities result from project modifications to recreation activities (Section 9.1) and costs of surveying and monitoring (Section 9.3.1). As shown in Exhibit 9-8, the total costs to other activities of flycatcher conservation activities is approximately $1.8 million (2004 dollars).

586. In addition, as described in Section 9.1, lost recreational activity has also resulted in regional economic impacts. Given the estimate of 2,250 angler days and 1,800 hunting days lost to the region annually since 1998, this results in a direct economic loss to the area of approximately $325,000 (2004 dollars). This loss in direct spending flowing through the economy results in total impacts of approximately $386,000 in lost sales, six jobs, $62,000 in salaries and wages, and $15,000 in state taxes.

[355] *Ibid.*
[356] *Ibid.*

Exhibit 9-8

PAST IMPACTS OF FLYCATCHER CONSERVATION ACTIVITIES ON FEDERAL LANDS ACTIVITIES, INCLUDING RECREATION AND SURVEY AND MONITORING EFFORTS

Recovery Unit	Management Unit	Total Past Costs (2004$)
Coastal California	Santa Ana	$20,000
	San Diego	$146,000
Basin and Mojave	Kern	$97,000
Lower Colorado	Little Colorado	$507,000
	Virgin	$16,000
	Pahranagat	$62,000
	Bill Williams	$49,000
Gila	Verde	$22,000
	Roosevelt	$794,000
Rio Grande	Upper Rio Grande	$4,000
Multiple Management Units		$71,000
	TOTAL*	**$1,788,000**

* Totals may not sum due to rounding.

9.6.2 Future Impacts

587. In the future, efficiency impacts are expected to result from project modifications to recreation activities and costs of surveying and monitoring. As shown in Exhibit 9-9, the total future costs to other activities of flycatcher conservation activities is approximately $3.2 million (2004 dollars assuming a seven percent discount rate).

Exhibit 9-9

SUMMARY OF FUTURE IMPACTS OF FLYCATCHER CONSERVATION ACTIVITIES ON FEDERAL LANDS ACTIVITIES, INCLUDING RECREATION AND SURVEY AND MONITORING EFFORTS, 2004-2023

		Present Value of Total Costs (2004$)		Annual Costs (2004$)	
Recovery Unit	**Management Unit**	**Using 7% Discount Rate**	**Using 3% Discount Rate**	**Using 7% Discount Rate**	**Using 3% Discount Rate**
Coastal California	Santa Ana	$57,000	$77,000	$5,000	$5,000
	San Diego	$227,000	$306,000	$21,000	$15,000
Basin and Mojave	Kern	$153,000	$202,000	$14,000	$14,000
Lower Colorado	Little Colorado	$680,000	$919,000	$64,000	$46,000
	Virgin	$228,000	$240,000	$21,000	$12,000
	Pahranagat	$227,000	$306,000	$21,000	$15,000
Gila	Verde	$23,000	$31,000	$2,000	$2,000
	Roosevelt	$1,500,000	$2,027,000	$142,000	$136,000
Rio Grande	Upper Rio Grande	$8,000	$11,000	$1,000	$1,000
Multiple Management Units		$82,000	$110,000	$8,000	$6,000
	TOTAL*	**$3,184,000**	**$4,229,000**	**$299,000**	**$252,000**

* Totals may not sum due to rounding.

588. In addition, as described in Section 9.1, lost recreational activity is also expected to continue to result in regional economic impacts due to closures in the Tonto NF. Given the estimate of 2,250 angler days and 1,800 hunting days lost to the region annually, direct economic loss to the local area of approximately $325,000 (2004 dollars) is expected. This loss in turn results in total annual impacts of approximately $386,000 in lost sales, six jobs, $62,000 in salaries and wages, and $15,000 in state taxes.

9.6.3 Non-Monetized Impacts

589. Exhibit 9-10 summarizes the impacts on activities that could not be monetized. Specifically, 26,127 WUI acres are included in the proposed CHD, the majority of which lies in the San Diego, Virgin, Verde, Roosevelt, Middle Gila/San Pedro, and Upper Rio Grande Management Units. In addition, two military installations located on Camp Pendleton in the San Diego Management Unit are included in the proposed CHD. As noted previously, this analysis does not attempt to quantify the impact to military readiness that may result from flycatcher conservation activities.

Exhibit 9-10

NON-MONETIZED FUTURE IMPACTS OF FLYCATCHER CONSERVATION ACTIVITIES, 2004-2023

Recovery Unit	Management Unit	Activity	
		Fire Management (WUI acres)*	**Military**
Coastal California	Santa Ynez	418	
	Santa Ana	1,437	• Marine Corps Base at Camp Pendleton • Fallbrook Naval Weapons Station
	San Diego	3,735	
Basin and Mojave	Owens	2	
	Mohave	471	
Lower Colorado	Little Colorado	61	
	Virgin	2,794	
	Pahranagat	35	
	Bill Williams	37	
	Hoover to Parker	624	
	Parker to Southerly International	747	
Gila	Verde	3,256	
	Roosevelt	2,603	
	Middle Gila/San Pedro	3,399	
	Upper Gila	1,431	
Rio Grande	San Luis Valley	1,309	
	Upper Rio Grande	2,680	
	Middle Rio Grande	1,089	
	TOTAL:	**26,127**	

* Based on an analysis of GIS data for WUI areas provided by the University of Wisconsin, Department of Forest Ecology & Management, Spatial analysis for conservation and sustainability (SILVIS) Lab, Online at: http://silvis.forest.wisc.edu/projects/WUI_Main.asp

9.7 Caveats to Economic Analysis of Impacts on the Other Activities

590. Exhibit 9-11 summarizes the key assumptions of the analysis of economic impacts on the other activities, as well as the potential direction and relative scale of bias introduced by these assumptions.

Exhibit 9-11

CAVEATS TO THE ECONOMIC ANALYSIS OF OTHER ACTIVITIES

Key Assumption	Effect on Impact Estimate
In the Tonto NF, only a portion of the total number of fisherman and hunters are assumed to continue to fishing and hunting activities at alternative sites within the Roosevelt Lake area.	+/-
The IMPLAN model used to estimate regional economic impacts is a static model and does not account for the fact that the economy will adjust. IMPLAN measures the effects of a specific policy change at one point in time. Over the long-run, the economic losses predicted by the model may be overstated as adjustments such as re-employment of displaced employees occurs.	+
The IMPLAN model used to estimate regional economic impacts relies on 1998 data. If significant changes have occurred in the structure of the affected counties economies, the results may be sensitive to this assumption. The direction of any bias is unknown.	+/-
Potential impacts to future actions on military lands resulting from flycatcher conservation activities are not included in this analysis.	-

- : This assumption may result in an underestimate of real costs.
+ : This assumption may result in an overestimate of real costs.
+/- : This assumption has an unknown effect on the magnitude of cost estimates.